

Production of nano-bentonite and the study of its effect on mutagenesis in bacteria *Salmonella typhimurium*

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Abstract

© 2016, Pleiades Publishing, Ltd. The production of nano-bentonite and its effects on mutation process in the strains of *Salmonella typhimurium* are studied. It is revealed that nano-bentonite particles essentially differ from bentonite particles in structure, size, and shape. Bentonite particles are cone-shaped and 0.3 to 1.0 μm in size, whereas nanobentonite nanoparticles are oval-shaped and 25 to 95 μm in size. Single particles (less than 10.0%) are irregular polyhedra and 0.6 μm in size. The structure of bentonite consists of separate fragments of constituent minerals composed of packages-lamelee 0.6 μm in size cemented with an amorphous mass. An amorphous mass containing single micrometer-sized packages-lamelee is observed in the structure of the nano-bentonite. It is determined that nano-bentonite does not possess mutagenic activity on microorganisms. The study of antimutagenic potential of nano-bentonite reveals that it possesses a moderate inhibitory effect on mutagenesis caused by mitomycin C, 2,4-dinitrophenylhydrazine, and ethyl methanesulphonate, but does not inhibit genotoxic potential of hydrogen peroxide. The results demonstrate that nano-bentonite is nongenotoxic and can be used for the development of next-generation safe nanotechnological materials.

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